

## REMARKS

The most recent Official Action has been carefully considered. Claims 1, 2, 4, 8, 9, 11 and 29-52 are currently pending and subject to examination. By the present amendment, claims 1, 8, 48 and 50 have been amended, claims 35, 42-47 and 49 have been cancelled, and claims 53-56 have been added. As these amendments do not include new matter, entry is believed in order and is therefore respectfully requested.

### 35 U.S.C. § 103(a)

Claims 1, 2, 4, 8, 9, 11 and 29-52 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,046,150 to Choy (hereafter "Choy") in view of U.S. Patent No. 5,403,549 to McNeil (hereafter "McNeil"). Specifically, the Examiner asserts that Choy teaches liquid cleaning or bleaching compositions comprising peroxygen sources such as monopersulfate, and surfactants, including ethoxylated phenols containing 8 to 16 carbon atoms and averaging 1.5 to 30 moles ethylene oxide per mole of alcohol. The Examiner further asserts that when the Choy compositions are used as hard surface cleaners, alkaline buffers may be used including "alkali metal carbonates." The Examiner considers the hard surfaces set forth in Choy as "within the scope of decontaminating materials contaminated with biological warfare agents." The Examiner states that solvents, including isopropanol, ketones, etc. may also be used in the compositions. The Examiner notes that Choy fails to teach "the use of acetone or a composition containing a monopersulfate compound, a carbonate or bicarbonate, a ketone, a cosolvent, and the other requisite components of the composition in the specific proportions as recited by the instant claims."

With respect to the secondary reference, the Examiner asserts that McNeil teaches a method and a composition for disinfecting matter or materials such as medical instruments, operating rooms, floors, etc. that have been contaminated with bacteria, bacterial spores, fungi or viruses. Specifically with respect to the composition, the Examiner asserts that the McNeil compositions contain "a fluid mixture containing a peroxy monosulfate salt and a carbonyl-containing compound and reaction products thereof," and that the carbonyl containing compound is particularly selected from the group consisting of acetone, 2-pentanone, 4-hydroxy-4-methyl-2-pentanone, etc. and that additionally, surfactants may be used in the compositions. Finally, the Examiner asserts that McNeil teaches that the use of a commercially available buffer does not interfere with the activity of the dioxirane containing reaction product, and that McNeil states in Example 2 that "mixing caroate with a ketone in the presence of a small amount of buffer yielded no bacterial growth which is desirable."

The Examiner concludes that it "would have been obvious to one of ordinary skill in the art at the time the invention was made to use acetone in the composition taught by Choy with a reasonable expectation of success because McNeil teaches the use of acetone in a similar disinfecting, hard surface cleaning composition and because Choy teaches the use of ketones as solvents in general." The Examiner further concludes that it "would have been obvious to one of ordinary skill in the art...to decontaminate materials contaminated by viruses by using a composition containing a monopersulfate compound, a carbonate or bicarbonate, a ketone, a cosolvent and the other requisite components of the composition in the specific proportions as recited by the instant claims, with a reasonable expectation of success because the broad teachings of Choy, in combination with McNeil, suggest decontaminating materials contaminated by viruses by using a composition containing a monopersulfate compound, a

carbonate or bicarbonate, a ketone, a co-solvent, and the other requisite components of the composition in the specific proportions as recited by the instant claims.”

The Examiner further asserts that Choy teaches a dual-chambered container-dispenser that would allow the monopersulfate compound and ketone to be mixed in situ and generate dioxirane. Choy is alleged to “clearly suggest” dual chambers wherein one chamber contains an H<sub>2</sub>O<sub>2</sub>/MMA solution, while the other chamber may include surfactants, colorants and solvents such as ketone.

This rejection is traversed and reconsideration is respectfully requested.

Independent claims 1, 8 and 52 of the present application are directed to a novel composition comprising: water; one or more monopersulfate compounds; one or more buffers, at least one of which is selected from the group consisting of alkali metal and alkaline earth metal salt forms of bicarbonate and/or carbonate; and one or more ketones, at least one of said ketones being selected from the group consisting of acetone, 2-butanone, 2-pentanone, 2-hydroxy-4-methyl-2-pentanone, hexafluoroacetone, trifluoroacetone, acetophenone, camphorsulfonic acid, and levulinic acid, which composition is formulated to achieve in situ generation of dioxirane. The compositions of claims 1 and 52 further include one or more co-solvents; the compositions of claims 8 and 52 further include surfactants. The compositions have a pH of from about 5 to about 9.

Choy is directed to liquid cleaning/bleaching compositions containing certain novel N-alkyl ammonium acetonitrile compounds (hereafter MMAs) to provide stability and increase shelf life of compositions containing peroxyacid bleaching compounds in alkaline solutions (see generally, “Background of the Invention” and specifically column 2, lines 47-50 and column 3, lines 1-4). Choy discloses monopersulfates or the equivalent aqueous form, Caro’s acid, (peroxymonosulfuric acid, H<sub>2</sub>SO<sub>5</sub>) as a suitable active oxygen source (column 5, lines 1-3 and lines 18-21). He further describes his composition as using “[n]ovel derivatives ... [including] **peroxyimidic intermediates** that are believed formed from the **novel nitriles in the presence of an active oxygen source.**” (Column 4, Lines 17-20). Generally, peroxyimidic acid species form from the reaction of a peroxide anion (OOH<sup>-</sup>) or hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) with nitriles.

With respect Choy’s broad teaching of a ketone ingredient, Applicants note that ketone is disclosed, for purposes of formulating the Choy compositions, as a **solvent** solely with respect to providing a suitable liquid medium for Choy’s novel MMAs. There is no disclosure or suggestion that the ketone is being provided to react with the oxygen source, at any time, to generate dioxirane. In fact, any such inference is contrary to the broad and specific teachings of Choy, wherein the oxygen source is provided to generate peroxyimidic acid intermediaries from the combination of his novel MMAs and the oxygen source. Peroxyimidic acid would not be generated if the ketones were used to react with the oxygen source to generate a dioxirane.

The Examiner notes that Choy does not teach the use of acetone or a composition containing a monopersulfate compound, a carbonate or bicarbonate, a ketone, a cosolvent, and the other requisite components of the composition in the specific proportions as recited by the instant claims, and therefore turns to McNeil for such teachings. McNeil is one of thousands of patents for disinfecting, hard surface cleaning compositions. However, McNeil is not directed to a cleaning composition involving the generation of peroxyimidic acid; rather, it involves the generation of dioxirane. Further, the ketone in McNeil is used to generate the dioxirane by

reacting with the oxygen source therein; the ketone in Choy is used as a solvent for Choy's novel MMAs. Therefore, while McNeil recites ketones used in cleaning compositions, its teachings are simply not relevant to the composition and teachings of Choy. The generation of peroxyimide acid does not involve ketones, and the use of ketones to combine with an oxygen source to generate dioxirane destroys any potential for generating peroxyimide acid. Thus, the combination of the teachings of the vastly different compositions of Choy and McNeil (one generating peroxyimide acid, the other dioxirane) is not obvious, as suggested by the Examiner. Furthermore, the choice of ketones as suggested by McNeil to generate dioxirane in its compositions provide no guidance in the choice of ketones for purposes of a solvent used with Choy's novel MMAs in his composition.

Even if we adopted the Examiner's asserted motivation to combine, that is, that Choy discloses a ketone solvent in a cleaning/disinfecting composition, and McNeil discloses acetone as a ketone ingredient in a disinfecting composition, if the inclusion of the specific McNeil ketones into the compositions of Choy achieved the generation of dioxirane as suggested by the Examiner, it would destroy the purposes of Choy by failing to generate peroxyimide acid. As such, the combination is by no means obvious; rather, it would appear that a person skilled in the art searching for a ketone suitable for use in the Choy composition would select a ketone that would function as a solvent with compounds similar to Choy's MMAs, and would not react with the oxygen source (leaving it free to react with the novel MMAs as intended in Choy). However, McNeil does not provide any useful guidance in the incorporation of specific ketones in the Choy composition (other than the destructive generation of dioxirane).

In addition, regardless of whether each ingredient of the present invention is disclosed via broad generic terms, a person of ordinary skill in the art seeking to formulate a composition adapted for in situ delivery of dioxirane would not find the requisite guidance in the teachings of Choy. For example, instant claim 1 requires that the present composition function to achieve in situ generation of dioxirane with a composition pH of between 5 and 9. Choy, on the other hand, merely discloses that the pH range of the composition may be between 1 and 10 depending on the desired application, but does not provide guidance on how to achieve this where the peroxygen source is monopersulfate, combined with MMAs and a selected solvent of ketone. There is no teaching or suggestion in Choy that would motivate buffering this highly acidic combination to a neutral pH.

McNeil fails to cure this deficiency since McNeil discloses and prefers acidic compositions with pH less than or equal to 4. Indeed, McNeil discourages the use of buffers. Hence, there is no motivation to also buffer the composition resulting from the Examiner's selection of ingredients in order to achieve the requisite pH of 5-9 from the highly acidic composition resulting from the selected ingredients. Therefore, it is clear, without the guidance provided by the present application, that a person of ordinary skill in the art seeking to formulate a neutral (environmentally friendly) composition adapted for in situ generation of dioxirane, could not achieve this by reference to the asserted combination of Choy in view of McNeil.

Applicants agree with the Examiner that Choy suggests a dual chambered container/dispenser system, but emphatically disagree that Choy discloses a separation of ingredients that would permit in situ generation of dioxirane. The only disclosure by Choy of a ketone ingredient is found in column 10 as one of several dozen possible solvents for use in the "Liquid Medium" (see, column 10, lines 5-7. Liquid Medium" and line 28 suggesting ketones as

one of many potential solvents for the liquid medium). The “Liquid Medium” is expressly defined by Choy as the suitable medium for the N-alkyl ammonium acetonitrile compounds, or MMAs (id., lines 6-9 “the inventive compounds [MMAs] are combined with a liquid medium”).

In the disclosure of the dual chambers in Choy column 11, pointed out by the Examiner as evidence of capability of in situ dioxirane generation, Applicants submit that ketone is disclosed as a potential solvent only in the liquid medium containing the MMA, and is not disclosed as a component of the other chamber. A general disclosure of adding other agents such as solvents is not specific as to which chamber, but one may assume text consistency, and since the purpose of the solvent is to solubilize the MMA, and solvent, including ketone, is specifically disclosed in section 7 with respect to MMA, it is logical to assume this agent would be contained with the MMAs, which are always contained with the peroxygen source, typically  $\text{H}_2\text{O}_2$  in Choy, but conceivably monopersulfate in a very broad reading of Choy. Ketone is never suggested by Choy as an ingredient that must be contained in such a way as to be kept separate from the peroxide source.

It is axiomatic that to establish prima facie obviousness of the claimed invention, all the claim limitations must be taught or suggested by the prior art. Furthermore, it is also axiomatic that a reference combination must be enabling in order to render the invention obvious. Applicants submit that the prima facie case is not established because the compositions of Choy fail to suggest or achieve the requisite element of in situ generation of dioxirane. In fact, they fail to suggest or achieve the requisite element of generation of dioxirane. Further, the generation of dioxirane would be contrary to Choy’s teachings, and destructive to his compositions. McNeil’s specific disclosure of acetone as a ketone as a reactant with an oxygen source for the generation of dioxirane fails to (and cannot) cure this deficiency, as the generation of dioxirane, if possible, is most certainly destructive to the Choy composition. In addition, the teachings of the combination of Choy in view of McNeil do not enable the present invention since they fail to teach a composition capable of in situ generation of dioxirane as instantly required in all claims.

Further, a prima facie case is not established because neither Choy nor McNeil provide guidance for selection of the components of the present invention for a formulation having a pH of between 5 and 9. In the absence of express guidance as to a desired pH for the dioxirane-generating composition, the specific ingredients selected by the Examiner from the combined references results in an acidic composition, as disclosed by McNeil, and neither reference sets forth a teaching or suggestion that the dioxirane-generating composition should be buffered to a neutral pH as required by the present inventive composition. The pH presently disclosed is not obvious in light of these components. However, Applicants’ composition provides the surprising benefits of easy storage, handling and a longer shelf life, as well as the benefit of capability for large scale application without damage to the environment. There is no guidance in either reference to achieve the benefits achieved by the selected components in combination with the selected pH as presently required. There is no teaching or suggestion in the combined teachings of Choy and McNeil or, to the knowledge of the Applicants, anywhere in the art, of an in situ dioxirane-generating composition formulated to be applied at a neutral pH. The combination of Choy and McNeil, therefore, fails to teach all the claim limitations of the instant independent claims and a prima facie case has not been established.

Finally, Choy's composition regards an MMA compound and a source of active oxygen, surfactants and other adjuncts. MMAs are not an element of the new claims 53-56 of the present application. However, they are at the core of Choy's composition; the remaining elements (preferred or optional) of Choy's composition are incorporated therein merely to aid the functionality and effectiveness of the MMAs. Therefore, Choy does not make obvious the new claims of the present application, and the removal of MMA from the Choy composition would not be obvious. Furthermore, McNeil does not cure this deficiency.

Hence, the rejection of independent claims 1 and 8 and claims 2, 4, 9, 11 and 29-52 under 35 U.S.C. § 103 as unpatentable over Choy in view of McNeil has been overcome by the claim amendments presented herewith and these remarks. Reconsideration is respectfully requested.

### **Double Patenting.**

The rejection of claims 1, 2, 4, 6-9, 11-17 and 19-23, under the doctrine of obviousness-type double patenting as being unpatentable over claims 8-27 and 34-40 of co-pending application Serial No. 10/693,194 is maintained. The Applicants at this time have not provided a terminal disclaimer in this application, but will consider such a disclaimer in the event the claims in this application and the co-pending application are allowed, and in the form allowed would constitute obviousness-type double patenting.

### **Conclusion.**

Applicants believe this is a thorough and comprehensive response to the rejections of claims 1, 2, 4, 8, 9, 11 and 29-52 under 35 U.S.C. § 103 set forth by the Examiner in the most recent office action. Applicants respectfully submit that the present application is in condition for allowance. The Examiner is encouraged to contact the undersigned to resolve efficiently any formal matters or to discuss any aspects of the application or of this response. Otherwise, early notification of allowable subject matter is respectfully solicited.

Respectfully submitted,

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